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REMARKS

This response is intended as a full and complete response to the non-final Office Action mailed December 17, 2004. In the Office Action, the Examiner notes that claims 1-9 and 19 and 21-24 are pending, of which claims 1-9 and 19 and 21-24 are rejected. By this response, claims 1-9, 19, and 21-24 continue unamended.

Rejection under 35 U.S.C. §103

A. Claims 1-6, 19, 22 and 23

The Examiner has rejected claims 1-6, 19, 22 and 23 under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. (US006438596B1, hereinafter "Ueno") in view of Hokanson (US006094680A; hereinafter "Hokanson"). The Applicants respectfully traverse the rejection.

The Applicants' independent claims 1 and 19 recite:

"1. In an interactive information distribution system including a network of provider equipment and subscriber equipment, apparatus comprising:
a plurality of servers coupled to respective subscriber equipment, each of said servers having a primary storage partition for storing frequently requested video assets, each of said servers having a secondary storage partition for storing some of a remaining portion of infrequently requested video assets, said infrequently requested video assets being divided and selectively distributed amongst said secondary partitions of said plurality of servers; and

a manager, coupled to each of said plurality of servers for routing video assets between said servers in response to video asset requests, and for migrating video assets between storage partitions in response to a video asset request rate traversing a threshold rate.." (emphasis added)

"19. In an interactive information distribution system comprising a plurality of servers coupled to respective subscriber equipment, each of said servers having a primary storage partition for storing a first portion of video assets and a secondary storage partition for storing at least some of a remaining portion of said video assets, said servers providing video assets to respective subscriber equipment in response to subscriber requests, a method comprising the steps of:

determining an asset request rate for each of said video assets stored in each server;

comparing said determined asset request rates with respective threshold rates;

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in the case of video assets stored on a secondary partition having a request rate exceeding said respective threshold rate, migrating said video assets stored on said secondary storage partition to a corresponding primary storage partition;

wherein in the case of said determined asset request rate for video assets stored in a primary storage partition being below a respective threshold rate, migrating said video assets from said primary partition to a corresponding secondary partition; and

dividing and selectively distributing said video assets below said respective threshold rate amongst said secondary partitions of said plurality of servers." (emphasis added)

The test under 35 U.S.C. §103 is not whether an improvement or a use set forth in a patent would have been obvious or non-obvious; rather, the test is whether the claimed invention, considered as a whole, would have been obvious. Jones v. Hardy, 110 U.S.P.Q. 1021, 1024 (Fed. Cir. 1984) (emphasis added). Moreover, the invention as a whole is not restricted to the specific subject matter claimed, but also embraces its properties and the problem it solves. In re Wright, 6 U.S.P.Q. 2d 1959, 1961 (Fed. Cir. 1988) (emphasis added). The combination of Ueno and Hokanson fails to teach or suggest the Applicants' invention as a whole.

In particular, the Ueno reference discloses:

A center server 1001 that stores therein video sources having a relatively low frequency in access, and local servers 1005 and 1006 that store therein video sources having a relatively high frequency in access. A core network 1002 informs a server resources management control unit 1003 of the conditions of resources for the respective servers, via channels 1014, 1015, and 1016. The network resources management control unit 1004 manages and controls the network resources, such as the bands of transmission lines contained in the core network 1002, and the buffer capacities of exchange nodes. (See Ueno, col. 18, lines 21-63, and FIG. 10).

Furthermore, the Hokanson reference discloses:

The data can be made more or less available to the clients in a number of ways. One technique is to move the data from one server to another to make it more readily available to the requesting clients. ... Another technique is to employ a hierarchical storage structure that is implemented as a collection of heterogeneous storage devices having different associated performance and costs. For instance, the devices might include cache memory (high performing/high cost storage), disk drives, CD-ROMs on carousal, and tape back-up (low performance/low

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cost storage). The network manager moves data between the different storage hierarchies according to their cost/availability contribution. Data that requires ready availability despite the cost is stored in higher performing devices (cache, disk drives) and data that requires less availability with little expense is stored in lower performing devices (CD-ROM, tape back-up). (See Hokanson, column 9, lines 47-67).

Moreover, the Hokanson reference discloses

In one embodiment, the TSG 604 maintains a status for each variable demand-cast stream being served. The status is adjusted upon receipt by the TSG 604 of certain messages from the SM 602. The basic states for the status comprise an "acquired" state which denotes that the demand-cast stream is in use by one or more terminals 606, and a "released" state which denotes that the demand-cast stream is not in use by any terminal 606. The TSG 604 keeps serving "acquired" demand-cast streams by multiplexing them into appropriate transport streams and replaces "released" demand-cast streams with new demand-cast streams upon receipt of a request message from the SM 602. In a preferred embodiment, the TSG 604 also keeps track of the order in which the streams are released, so that the oldest released stream may be used as the preferred candidate for replacement. (See Hokanson, column 11, lines 9-30.)

Even if the two references could somehow be operably combined, the combined references disclose a cluster of servers having a hierarchy of storage devices where content is stored on the hierarchy of subscriber devices at a single server based upon the subscriber's requests (see Hokanson), and a center server which stores therein video sources having a relatively low frequency in subscriber access (see Ueno). In other words, the combined references teach that highly requested assets are stored in primary storage devices coupled to each server, and minimally accessed assets are stored in secondary storage devices respectively coupled to each server, as well as a designated center server for storing the minimally requested assets. Nowhere in the combined references is there any teaching or suggestion that the minimally accessed assets are distributed amongst the plurality of servers. That is, the Applicants' invention provides a decentralized server network where "the infrequently requested video assets are divided (decentralized) amongst each of the plurality of head-ends and then selectively stored on their respective secondary storage partitions." The teachings of the Ueno and Hokanson references are silent with respect to "dividing and selectively

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distributing said video assets below said respective threshold rate amongst said secondary partitions of said plurality of servers." By contrast, the combined references disclose that

The content manager 142 then evaluates whether the movie should be moved within the storage hierarchy to a higher or lower hierarchical level based upon the subscribers' requests and the present cost in relation to the defined cost/availability balance. (See Hokanson, column 11, lines 16-20.)

That is, the video assets are only moved or replicated between the hierarchal storage devices at each server, as opposed to having the minimally requested assets distributed across the secondary storage devices associated with each of the plurality of servers.

Thus, the Applicants' invention goes beyond the teaching of the cited references by further dividing the infrequently accessed video assets and selectively distributing them amongst the secondary partitions of the plurality of servers. Therefore, the Ueno and Hokanson references fail to teach or suggest the Applicants' invention as a whole.

Furthermore, the Applicants' invention solves the problem of allowing maximum access to the video titles with minimum network cost associated with their delivery. The Applicants' invention solves this problem in a more cost effective manner than the cited references by dividing and selectively distributing said video assets below said respective threshold rate amongst said secondary partitions of said plurality of servers.

Specifically,

"the primary storage partition 218 on the primary storage device 216 at each head-end 210 is used to store frequently requested video assets and temporarily cached library video assets. Each primary storage partition 218 at each head-end 210 typically has the same frequently requested video assets as any other head-end 210.

The secondary storage partition 219 is used to store portions of the infrequently requested video assets. An entire library of infrequently requested video assets is divided and stored amongst the plurality of head-ends 210 at each of the secondary storage partitions 219 on their respective primary storage devices 216.

An infrequently requested video asset is typically stored on the secondary storage partition 219 at a single head-end 210. However, the request rate for that video asset may warrant additional storage at other head-ends 210. As such, the content may be replicated and stored thereafter. In this manner,

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video assets that do not warrant storage across the entire system of head-ends 210 in the interactive information distribution system 200 may still be dynamically stored at multiple head-ends 210. Such dynamic storage corresponding to those neighborhoods having higher request rates than others is made in accordance with an algorithm that allows maximum access to the video titles with minimum network cost associated with their delivery."

By contrast, both the Ueno and Hokanson references are silent with respect to how the infrequently accessed video assets are divided and distributed amongst servers. As noted above, the Applicants' invention provides dynamic storage corresponding to those neighborhoods having higher request rates than others, such that maximum access to the video titles with minimum network costs associated with their delivery can be provided. Therefore, the combined references fail to solve the problem of distributing video assets in the manner that the Applicants' invention does, and consequently the combined references fail to teach or suggest the Applicants' invention as a whole.

As such, the Applicants submit that independent claims 1 and 19 are not obvious and fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder. Furthermore, claims 2-6, and 22 and 23 depend directly or indirectly from, respectively, independent claims 1 and 19 and recite similar features thereof. As such, and at least for the same reasons as discussed above, the Applicants submit that claims 2-6, 22 and 23 are also not obvious and fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder. Therefore, the Applicants respectfully request that the rejections be withdrawn.

B. Claims 7-9 and 24

The Examiner has rejected claims 7-9 and 24 as being unpatentable over Ueno and Hokanson as applied to claims 6 and 23 above, and further in view of Kikinis (US006163795A, hereinafter "Kikinis"). The Applicants respectfully traverse the rejection.

For the reasons set forth above, the Applicants submit that independent claims 1 and 19 are not obvious in view of the combination of Ueno and Hokanson. Claims 7-9 and 24 depend directly or indirectly from, respectively, independent claims 1 and 19

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and recite additional features thereof. As such, and for at least the same reasons as discussed above, the Applicants submit that dependent claims 7-9 and 24 are also ~~not~~ obvious in view of the combination of Ueno and Hokanson.

Furthermore, Kikinis fails to teach or even suggest "dividing and selectively distributing said video assets below said respective threshold rate amongst said secondary partitions of said plurality of servers." In particular, Kikinis discloses:

"Clients can monitor their service as often as they like for newly available video in the areas of interest they have indicated, and can then select clippings they wish to see. When a client selects one or more clippings, the video data is sent to the client on the interconnecting link to the server in a compressed mode, and the client can either store or immediately view the data sent.

FIG. 1B is a diagram showing file server 1 in additional detail, and, by example, the architecture of all other file servers in the global architecture. A CPU 2 and a random-access memory (RAM) are connected to an internal bus 18, which also connects to network ports 10 and 30 that couple file server 1 with other file servers on the network."

However, nowhere in the combined references is there any teaching or suggestion of: "dividing and selectively distributing said video assets below said respective threshold rate amongst said secondary partitions of said plurality of servers." Therefore, the combination of Ueno, Hokanson, and Kikinis fails to teach or suggest the Applicants' invention as a whole.

As such, the Applicants submit that claims 7-9 and 24 are not obvious and fully satisfy the requirements of 35 U.S.C. §103. Therefore, the Applicants respectfully request that the rejection be withdrawn.

C. Claim 21

The Examiner has rejected claim 21 as being unpatentable over Ueno and Hokanson as applied to claim 19 above, and further in view of Kenner (US006269394B1, hereinafter "Kenner"). The Applicants respectfully traverse the rejection.

For the reasons set forth above, the Applicants submit that independent claim 19 is not obvious in view of the combination of Ueno and Hokanson. Claim 21 depends from independent claim 19 and recites additional features thereof. As such, and for at

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least the same reasons as discussed above, the Applicants submit that dependent claim 21 is also not obvious in view of the combination of Ueno and Hokanson.

Furthermore the Kenner reference fails to bridge the substantial gap as between the Ueno and Hokanson references and the Applicants' invention. In particular, the Kenner reference discloses deleting out of date or unnecessary duplicated data from a storage device (see Kenner, column 12, lines 35-40). However, nowhere in the Kenner reference is there any teaching or suggestion of "dividing and selectively distributing said video assets below said respective threshold rate amongst said secondary partitions of said plurality of servers." Therefore, the Ueno, Hokanson and Kenner references fail to teach or suggest the Applicants' invention as a whole.

As such, the Applicants submit that claim 21 is not obvious and fully satisfies the requirements of 35 U.S.C. §103. Therefore, the Applicants respectfully request that the rejection be withdrawn.

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CONCLUSION

Thus, Applicants submit that none of the claims, presently in the application, is anticipated or obvious under the provisions of 35 U.S.C. §103. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Eamon J. Wall, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

Dated: _____

3/8/05



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